

# Lower Tertiary Clastic Gas/Oil (LO-LL C2) Play

*Textularia warreni* through *Globorotalia uncinata* biozones

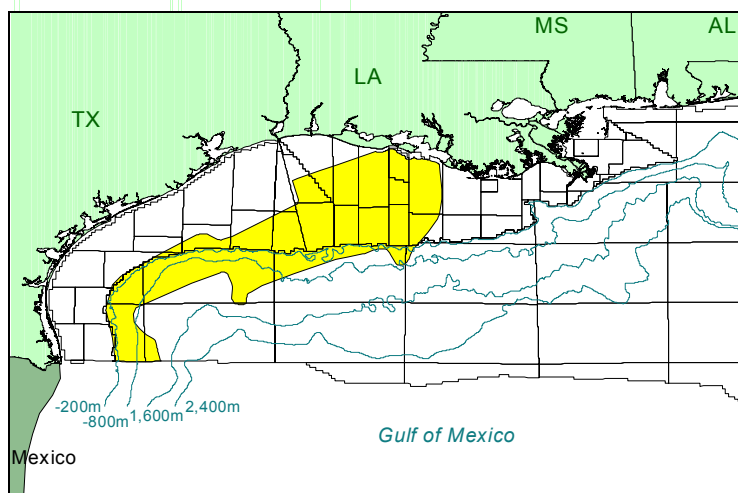


Figure 1. Play location.

LO-LL C2 Lwr Tertiary Clastic Gas & Oil Marginal Probability = 1.00	Number of Pools	Oil (Bbbl)	Gas (Tcf)	BOE (Bbbl)
<b>Reserves</b>				
Original proved	0	0.000	0.000	0.000
Cumulative production	--	0.000	0.000	0.000
Remaining proved	--	0.000	0.000	0.000
Unproved	0	0.000	0.000	0.000
Appreciation (P & U)	--	0.000	0.000	0.000
<b>Undiscovered Conventionally Recoverable Resources</b>				
95th percentile	--	0.687	2.830	1.256
Mean	55	1.237	3.878	1.927
5th percentile	--	2.339	5.498	3.231
<b>Total Endowment</b>				
95th percentile	--	0.687	2.830	1.256
Mean	55	1.237	3.878	1.927
5th percentile	--	2.339	5.498	3.231

Table 1. Assessment results for reserves, undiscovered conventionally recoverable resources, and total endowment.

## Play Description

The conceptual Lower Tertiary Clastic Gas/Oil (LO-LL C2) play is defined by (1) the *Textularia warreni* through *Globorotalia uncinata* biozones, (2) the play's location mostly on the modern offshore Texas slope and western offshore Louisiana shelf (figure 1), and (3) anticipated oil and gas production. The play extends along depositional strike from the Port Isabel and Alaminos Canyon Areas offshore Texas to the eastern Eugene Island Area offshore Louisiana.

Updip to the west and north-west, the play is limited to the updip-most occurrence of oil, which coincides with the downdip boundary of the Lower Tertiary Clastic Gas (LO-LL C1) play. Downdip to the east and southeast, the play is limited by the anticipated downdip occurrence of gas. To the south, the play extends into Mexican national waters, while to the northeast, the play extends onshore into Louisiana and, in the offshore, to the eastward interpreted limit of lower Tertiary fan deposition.

The following discussion is from Blood (2000), unless otherwise noted.

## Play Characteristics

The LO-LL C2 play combines deep-sea fan sediments of the lower Tertiary and the Midway, Wilcox, Claiborne, and Vicksburg Formations. Potential reservoirs exist in widespread lobe sheet sands that were deposited on a relatively flat and unconfined surface. The lobes may be shingled and stacked into thick, nearly continuous sand bodies (Grecula *et al.*, 2000 and Rehmer *et al.*, 2000). These potential reservoirs occur at depths greater than 20,000 feet subsea and generally lie below allochthonous salt. Areas where potential reservoirs lay at depths greater than 30,000 feet subsea were

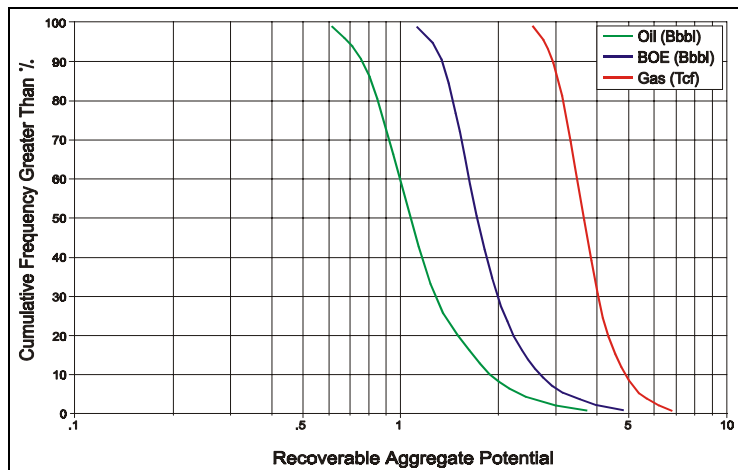


Figure 2. Cumulative probability distribution for undiscovered conventionally recoverable resources.

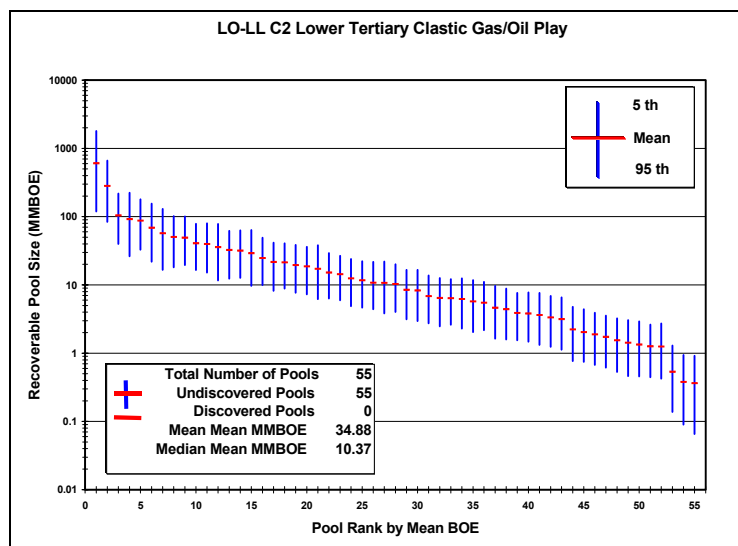


Figure 3. Pool rank plot showing the number of discovered pools (red lines) and the number of pools forecast as remaining to be discovered (blue bars).

not considered prospective.

Source rocks in the play's area are thought to be formed from both lower Tertiary and upper Mesozoic pelagic sediments. Wagner *et al.* (1994) places lower Tertiary with terrestrial and upper Cretaceous marine organic sources within the play's geographic boundaries. Piggott and Pulham (1993) place upper Mesozoic carbonates with gas-producing organic matter and an Eocene oil source in the same area. Either case produces oil and gas. In addition, the play is mostly overlain by allochthonous salt that conducts heat, resulting in lower temperatures than would be expected at the depth of the anticipated reservoirs. This reduces the chances for oil to have been altered to thermogenic dry gas.

Significant structural features of the LO-LL C2 play are salt-cored anticlines and salt-cored ridges. The cores of these folds are remnants of a nearly uniform autochthonous salt sheet that sourced the overlying salt canopy through now near-vertical welds. Potential seals are provided by the juxtaposition of reservoir sands with shales and salt, either structurally (e.g., faulting) or stratigraphically (e.g., lateral shales, overlying shales).

## Discoveries

No wells have been drilled in the LO-LL C2 play prior to this study's January 1, 1999, cutoff date.

## Assessment Results

The marginal probability of hydrocarbons for the LO-LL C2 play is 1.00. The play contains a mean total endowment of 1.237 Bbo and 3.878 Tcfg (1.927 BBOE) (table 2).

Assessment results indicate that undiscovered conventionally recoverable resources (UCRR) have a range of 0.687 to 2.339 Bbo and 2.830 to 5.498 Tcfg at the 95th and 5th percentiles, respectively (figure 3). Mean UCRR equal mean total endowment. These undiscovered resources might occur in as many as

55 pools, the largest of which has a mean size of 608 MMBOE (figure 4). The mean mean size of the five largest undiscovered pools is 235 MMBOE and the mean mean size of all 55 pools is 35 MMBOE.

## Exploration Future

The LO-LL C2 play's great depth and location below an allochthonous salt canopy are two technical concerns facing explorationists in this play. Other technical concerns include developing and maintaining reservoir-quality porosity and permeability in the prospective interval, and the extent to which deep-sea fan sands were deposited over the play's area.

## References

- Blood, Taylor. 2000. Lower Tertiary deep marine sandstone plays of the Gulf of Mexico outer continental shelf: Unpublished internal Minerals Management Service report.
- Grecula, Martin, Peter Sixsmith, Graham Potts, Stephen Flint, and DeVille Wickens. 2000. Abstract: Influence of the punctuated growth of basinal structures on the stacking patterns of basin floor and slope turbidite fans: Laingsburg Formation, Karoo Basin, South Africa: AAPG Bulletin, vol. 84, No. 13 (Supplement).
- Piggott, Neil and Andy Pullham. 1993. Sediment rate as the control on hydrocarbon sourcing, generation, and migration in the deepwater Gulf of Mexico: Rates of geologic processes: GCSSEPM Foundation 14<sup>th</sup> Annual Research Conference.
- Rehmer, Donald E., Philip R. C. Dudley, and Arnold Bouma. 2000. Abstract: Architectural and reservoir characteristics of fine-grained depositional lobes, Tanqua Karoo, south Africa: AAPG Bulletin, vol. 84, No. 13 (Supplement).
- Wagner, B. E., Z. Sofer, and B. L. Claxton. 1994. Source rock in the lower Tertiary and Cretaceous, deepwater Gulf of Mexico: GCAGS Transactions, vol. 44, p. 729-736.